[23] DETERMINING PHYSIOLOGICAL MATURATION OF JOINTED GOATGRASS *(AEGILOPS CYLINDRICA)* CARYOPSES. Michael P. Quinn* and Don W. Morishita, University of Idaho, Twin Falls; William I. Price, University of Idaho, Moscow.

Jointed goatgrass is an invasive winter annual grass weed that infests winter wheat fields and is capable of reducing wheat yield and quality. Control is difficult due to the close genetic relationship between jointed goatgrass and wheat. Greenhouse experiments were initiated in fall 2002 and 2003 and completed the following springs. The objectives were to: 1) identify the point in the jointed goatgrass maturation process when the seed first becomes germinable; 2) model germination response to varying maturity; and 3) examine seed germination differences within the spike. Jointed goatgrass plants were grown from seed, vernalized for 8 weeks at 4 C and grown in a greenhouse. Treatments were the number of days after anthesis (DAA) a spike was allowed to remain on the plant before harvesting and ranged from 2 to 34 DAAin one (2002), or two (2003) day increments. All treatments were assigned randomly to individual spikes. Anthesis was defined as one third of the spike having anthers dehiscent. Individual spikes were divided at harvest into three sections: top, middle and bottom. Spikelets in these sections were disarticulated from the rachis and allowed to afterripen for 72 days at room temperature. Samples were placed into a germinator at 15 C for 20 days and germination recorded each day. Samples were considered germinated when 3 nun of the radicle emerged. Goatgrass spikelets harvested <7 DAA had less than 3% germination for all spike sections and was extremely variable especially for the middle and bottom sections. Although limited, earliest germination observed was in samples harvested 2 DAA. Time to germination was similar for all sections of the spike. Jointed goatgrass germination by DAA was examined using a linear plateau model. This model describes a process in which germination initially increases linearly with maturity until the germination response achieves a constant value. The DAA or point in maturity at which there was no change in germination was 25, 21, and 23 d for the top, middle, and bottom spike sections. Maximum average germination of the top section was 72% compared to 86% for the bottom and middle sections. This suggests that factors other than developmental rate (ie dormancy) may impact germination in sections of the spike. A second year of the experiment was conducted to validate the model. Data from this experiment indicated that the germination models underestimated the response observed in the second year. Maximum germination in all three spike sections was >84%. Model validation for time to germination indicated that the models overestimated the response observed in the second year. Time to germination in all spike sections was greater in the second year. The variation in response may be attributed to minor environmental differences between years. Model validation indicates that variation in germination response between years may be too great for predictive model construction. However, this research demonstrates that control measures must be implemented earlier than previously prescribed to prevent goatgrass reproduction.